

JAPANESE

[JP,11-205342,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE
INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

*** NOTICES ***

JPO and NCIP I are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] Connect between two or more subnetworks identified by Domain ID, and one network is constituted. Said subnetwork has two or more base transceiver stations, and this base transceiver station has the base station ID which identifies said self Domain ID and each base transceiver station of said subnetwork to connect. The wireless terminal which communicates with said network through said base transceiver station In the base transceiver station selection approach which chooses one from said two or more base transceiver stations located in the location which fulfills the necessary quality of radio in case it communicates The home network to which said wireless terminal which moves connects a subnetwork most frequently, It classifies into the remote network which said wireless terminal connects at a migration place. Said wireless terminal memorizes the domain ID of a home network beforehand. When the base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists Quality chooses a most excellent base transceiver station with the same domain ID as a home network. The base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist. And it is the base transceiver station selection approach characterized by choosing the most excellent base transceiver station of quality with a different domain ID from a home network when a base transceiver station with a different domain ID from a home network exists.

[Claim 2] Connect between two or more subnetworks identified by Domain ID, and one network is constituted. The base station ID which said subnetwork has two or more base transceiver stations, and identifies Domain ID and each base transceiver station of said subnetwork to which self connects this base transceiver station It has the function which attests the wireless terminal which communicates with said network through this base transceiver station. In the base transceiver station selection approach which chooses one from said two or more base transceiver stations located in the location which fulfills the necessary quality of radio in case said wireless terminal communicates The home network to which said wireless terminal which moves connects a subnetwork most frequently, It classifies into the remote network which said wireless terminal connects at a migration place. Said wireless terminal memorizes the domain ID of a home network beforehand. Moreover, it has the function to memorize the domain ID of the base transceiver station by which authentication refusal was carried out on an authentication refusal domain list. When the base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists With the same domain ID as a home network, quality chooses a most excellent base transceiver station, and it connects. The base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist. And when a base station [**** / a connection-refusal domain list / un-] exists with a different domain ID from a home network Authentication is required of the base transceiver station in which has not registered with a connection-refusal domain list with a different domain ID from a home network, and quality is most excellent. When connection is refused as a result of authentication, after adding the domain ID of this base transceiver station

to a connection-refusal domain list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal domain list / un-] exists It is the base transceiver station selection approach characterized by choosing this base transceiver station and connecting when the actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent is repeated and connection is permitted as a result of authentication.

[Claim 3] Connect between two or more subnetworks identified by Domain ID, and one network is constituted. The base station ID where said subnetwork has two or more base transceiver stations, and this base transceiver station identifies self Domain ID and each base transceiver station of said subnetwork to which it belongs In the base transceiver station selection approach which chooses one from two or more base transceiver stations which fulfill the necessary quality of radio in case it has the function which attests the wireless terminal which communicates with said network through this base transceiver station and a wireless terminal communicates The home network to which said wireless terminal which moves connects a subnetwork most frequently, It classifies into the remote network which said wireless terminal connects at a migration place. Said wireless terminal memorizes the domain ID of a home network beforehand. Moreover, it has the function to memorize the base station ID by which authentication refusal was carried out on an authentication refusal base station list. When it has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists It has the same domain ID as a home network. On a connection-refusal base station list by un-registering And when quality requires authentication of a most excellent base transceiver station and is denied connection as a result of authentication, after adding the base station ID of this base transceiver station to a connection-refusal base station list, When it has the same domain ID as a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists It has the same domain ID as a home network. On a connection-refusal base station list by un-registering And quality repeats the actuation which requires authentication of a most excellent base transceiver station. A base station [**** / a connection-refusal base station list / un-] does not exist with the domain ID same in two or more base transceiver stations which fulfill the necessary quality of radio as a home network. And when a base station [**** / a connection-refusal base station list / un-] exists with a different domain ID from a home network Choose the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent, and authentication is required. When connection is refused as a result of authentication, after adding the base station ID of this base transceiver station to a connection-refusal base station list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists It is the base transceiver station selection approach characterized by choosing this base transceiver station when the actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from home NETTOKU, and quality is most excellent is repeated and connection is permitted as a result of authentication.

[Claim 4] It is the base transceiver station selection approach given in any 1 term of claim 1 characterized by forming a switch in a wireless terminal, and said wireless terminal starting base transceiver station selection actuation periodically when quality degradation of a power up or radio is detected, or when a user turns on said switch - claim 3.

[Claim 5] The base transceiver station selection approach given in any 1 term of claim 1 characterized by using the received field strength from a base transceiver station as quality of radio - claim 4.

[Claim 6] The base transceiver station selection approach given in any 1 term of claim 1 characterized by using the error rate of the input signal from a base transceiver station as

quality of radio - claim 4.

[Claim 7] The base transceiver station selection approach given in any 1 term of claim 1 characterized by using the traffic load of a base transceiver station as quality of radio - claim 4.

[Translation done.]

*** NOTICES ***

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the base transceiver station selection approach in wireless LAN.

[0002]

[Description of the Prior Art] The roaming approach of the existing wireless LAN is explained below as a conventional technique 1. The roaming approach is supported in WaveLAN of a 2.4GHz band wireless LAN product. By this approach, a base transceiver station has the domain ID for identifying the subnetwork to which the base station ID and local station for identifying a base station belong. A wireless LAN terminal memorizes beforehand the domain ID of the subnetwork which a local station usually connects.

[0003] When it acts as powering on, or when received field strength deteriorates during a communication link below at a threshold, in accordance with the memorized domain ID, a wireless LAN terminal chooses the largest base station of received field strength, and connects. The base station which is not in agreement with the memorized domain ID is not chosen.

(Refer to reference: "NCR Japan, and "WaveLAN system WaveLAN / PCMCIA card installation and actuation""")

[0004] Next, the hand off approach of an automobile and a cellular-phone system is explained below as a conventional technique 2. The hand off approach is supported in the automobile and the cellular-phone system. By this approach, a base transceiver station has a simultaneous paging area number for identifying the simultaneous paging area to which the base station ID and local station for identifying a base station belong. A terminal does not memorize beforehand the simultaneous paging area number which a local station usually connects.

[0005] When it acts as powering on, or when received field strength is below a threshold and the error rate of an input signal exceeds a threshold during a communication link, regardless of simultaneous paging area, a terminal chooses the largest base station of received field strength, and connects.

(Refer to reference: "Research & Development Center for Radio System and "digital method land mobile radiotelephone system system standard RCRSTD-27""")

[0006]

[Problem(s) to be Solved by the Invention] A wireless LAN terminal can consider the use gestalt which moves ranging over between a remote network etc. and subnetworks from a home network from migratory [the]. At this time, the packet transfer between a remote network and a home network is performed, and also while connecting with a remote network, the packet transfer protocol (for example, Mobile IP) which enables the same communication link as the time of home network connection is proposed. In order that this protocol might carry out capsuling of the packet and might transmit between a remote network and a home network, it had the technical problem that communication link effectiveness fell by the overhead.

[0007] Moreover, by the roaming approach of the conventional technique 1 mentioned above, since it cannot connect with a base transceiver station when a wireless LAN terminal moves to the subnetwork from which Domain ID differs, the problem that it cannot communicate even if it

mounts said packet transfer protocol by the network side arises.

[0008] Even when the hand off approach of the above-mentioned conventional technique 2 is applied to the base station selection approach of wireless LAN, a wireless LAN terminal moves it to the location where the base station of a home network and the base station area of a remote network overlap and the received field strength from the base station of a home network fulfills necessary quality, the case which chooses the base station of a remote network and is connected arises.

[0009] Since the packet transfer protocol between a home network and a remote network is performed when a wireless LAN terminal connects with a remote network, the problem that a large next door and communication link effectiveness fall [an overhead] arises.

[0010] When a wireless terminal moves to a remote network, this invention solves the technical problem that it is not connectable in a remote network base station to the 1st, and aims at offering the base transceiver station selection approach which can continue communicative using the packet transfer protocol between a home network and a remote network to it.

[0011] The technical problem that 2nd choose the base station of a remote network and it connects even when a wireless terminal moves to the location where the base station of a home network and the base station area of a remote network overlap and the received field strength from the base station of a home network fulfills necessary quality is solved, and it aims at offering the base transceiver station selection approach which can control decline in the communication link effectiveness by the overhead of a packet transfer protocol.

[0012]

[Means for Solving the Problem] According to this invention, an above-mentioned technical problem is solved by the means indicated to said claim.

[0013] Namely, invention according to claim 1 connects between two or more subnetworks identified by Domain ID, and constitutes one network. Said subnetwork has two or more base transceiver stations, and said base transceiver station has said domain ID of said subnetwork which self connects. It sets to the base transceiver station selection approach which chooses one from said two or more base transceiver stations located in the location which fulfills the necessary quality of radio in case it communicates, and the wireless terminal which communicates with said network through said base transceiver station is [0014]. Said wireless terminal memorizes the domain ID of a home network beforehand, and chooses the base transceiver station in which quality is most excellent with the domain ID same when the base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists as a home network by classifying into the home network to which said wireless terminal which moves connects a subnetwork most frequently, and the remote network which said wireless terminal connects at a migration place, and it is [0015]. When a base transceiver station with a domain ID which the base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist, and is different from a home network exists, it is characterized by choosing the most excellent base transceiver station of quality with a different domain ID from a home network.

[0016] With the conventional technique, quality chooses a most excellent base transceiver station with the domain ID same when the base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists as a home network, and it is [0017]. When a base transceiver station with a domain ID which the base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist, and is different from a home network exists, the points which choose the most excellent base transceiver station of quality differ with a different domain ID from a home network.

[0018] When the home network base station which fulfills necessary quality does not exist, this invention can choose the remote network base station which fulfills necessary quality, and also when a wireless terminal moves to a remote network, it can acquire the effectiveness which can continue a communication link with a packet transfer protocol.

[0019] Moreover, when a wireless terminal moves to the location where the area of a home

network base station and a remote network base station overlapped, it is possible to give priority to and choose a home network base station, and the effectiveness of preventing decline in the communication link effectiveness by the overhead of the packet transfer protocol between a remote network and a home network is acquired.

[0020] Invention according to claim 2 connects between two or more subnetworks identified by Domain ID, and constitutes one network. The base station ID which said subnetwork has two or more base transceiver stations, and identifies Domain ID and each base transceiver station of said subnetwork to which self connects said base transceiver station Said wireless terminal is set to the base transceiver station selection approach which chooses one from said two or more base transceiver stations in the location which fulfills the necessary quality of radio in case it communicates by having the function which attests the wireless terminal which communicates with said network through this base transceiver station, and it is [0021]. By classifying into the home network to which said wireless terminal which moves connects a subnetwork most frequently, and the remote network which said wireless terminal connects at a migration place, said wireless terminal memorizes the domain ID of a home network beforehand, and has the function to memorize the domain ID of the base transceiver station by which authentication refusal was carried out on an authentication refusal domain list, and it is [0022]. When the base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists With the same domain ID as a home network, quality chooses a most excellent base transceiver station, and it connects. The base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist. And when a base station [**** / a connection-refusal domain list / un-] exists with a different domain ID from a home network Authentication is required of the base transceiver station in which has a different domain ID from a home network, and has not registered with a connection-refusal domain list, and quality is most excellent, and it is [0023]. When connection is refused as a result of authentication, after adding the domain ID of this base transceiver station to a connection-refusal domain list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal domain list / un-] exists When the actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent is repeated and connection is permitted as a result of authentication, it is characterized by choosing this base transceiver station and connecting.

[0024] It has the function to memorize the domain ID of the base station where authentication refusal of said wireless terminal was carried out with the conventional technique on an authentication refusal domain list, and with the domain ID same when the base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists as a home network, quality chooses a most excellent base transceiver station, and it connects, and is [0025]. Authentication is required of the base transceiver station in which has a different domain ID from a home network, and has not registered with a connection-refusal domain list, and quality is most excellent when a base station [**** / a connection-refusal domain list / un-] exists with a domain ID which the base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist, and is different from a home network, and it is [0026]. When connection is refused as a result of authentication, after adding the domain ID of this base transceiver station to a connection-refusal domain list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal domain list / un-] exists When the actuation which requires authentication of the base transceiver station in which has a different domain ID from a home network, and has not registered with a connection-refusal base station list, and quality is most excellent is repeated and connection is permitted as a result of authentication, it differs in the point of having the configuration which chooses this base transceiver station and is connected.

[0027] Authentication of the wireless terminal which has moved by the remote network side in addition to an effect of the invention according to claim 1 is possible for this invention, and the effectiveness of preventing an unspecified wireless terminal accessing a network is acquired. Moreover, the domain ID of the base station by which authentication refusal was carried out is memorized, a wireless terminal can be excepted from base station selection, it prevents choosing again the base station by which authentication refusal was carried out at the time of reselection of a base station, and other base stations linked to the same remote network, and repeating an authentication demand and authentication refusal, and the effectiveness that base station selection time amount is shortened is acquired.

[0028] Invention according to claim 3 connects between two or more subnetworks identified by Domain ID, and constitutes one network. Said base transceiver station has the function which attests the wireless terminal which communicates with said network through the base station ID and this base transceiver station which identify self Domain ID and each base transceiver station of said subnetwork which belongs by said subnetwork having two or more base transceiver stations, and it is [0029]. In the base transceiver station selection approach which chooses one from two or more base transceiver stations located in the location which fulfills the necessary quality of radio in case a wireless terminal communicates The home network to which said wireless terminal which moves connects a subnetwork most frequently, By classifying into the remote network which said wireless terminal connects at a migration place, said wireless terminal memorizes the domain ID of a home network beforehand, and has the function to memorize the base station ID by which authentication refusal was carried out on an authentication refusal base station list, and it is [0030]. Authentication is required of the base transceiver station in which has the same domain ID as a home network, and has not registered with a connection-refusal base station list, and quality is most excellent when it has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists, and it is [0031]. When connection is refused as a result of authentication, after adding the base station ID of this base transceiver station to a connection-refusal base station list, When it has the same domain ID as a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists The actuation which requires authentication of the base transceiver station in which has the same domain ID as a home network, and has not registered with a connection-refusal base station list, and quality is most excellent is repeated, and it is [0032]. The base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent when a base station [**** / a connection-refusal base station list / un-] exists with a domain ID which it has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio, and a base station [**** / a connection-refusal base station list / un-] does not exist, and is different from a home network is chosen, authentication is required, and it is [0033]. When connection is refused as a result of authentication, after adding the base station ID of this base transceiver station to a connection-refusal base station list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists When the actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent is repeated and connection is permitted as a result of authentication, it is characterized by choosing this base transceiver station.

[0034] Authentication requires of the base transceiver station in which has the function memorize the base station ID where authentication refusal of said wireless terminal was carried out to the conventional technique on an authentication refusal base station list, and has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio, and has not registered with a connection-refusal base station list with the domain ID same when a base station [**** / a connection-refusal base station list / un-] exists as a home network, and quality is most excellent, and it is [0035]. The actuation which

requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with the same domain ID as a home network, and quality is most excellent when it has the same domain ID as a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists after adding the base station ID of this base transceiver station to a connection-refusal base station list, when connection is refused as a result of authentication repeats, and it is [0036]. Authentication is required of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent when a base station [**** / a connection-refusal base station list / un-] exists with a domain ID which a base station [**** / a connection-refusal base station list / un-] does not exist with the domain ID same in two or more base transceiver stations which fulfill the necessary quality of radio as a home network, and is different from a home network, and it is [0037]. When connection is refused as a result of authentication, after adding the base station ID of this base transceiver station to a connection-refusal base station list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists The actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent is repeated, and when connection is permitted as a result of authentication, it differs in the point of having the configuration which chooses this base transceiver station.

[0038] Authentication of the wireless terminal which has moved by the remote network side in addition to an effect of the invention according to claim 1 is possible for this invention, and the effectiveness of preventing an unspecified wireless terminal accessing a network is acquired. Moreover, authentication authorization or refusal of a wireless LAN terminal can be set up for every base station, and the effectiveness which can limit the base station in which the wireless terminal which has moved by the remote network side is held is acquired.

[0039] Moreover, a wireless terminal memorizes the base station ID by which authentication refusal was carried out, excepting from base station selection is possible, it prevents choosing again the base station by which authentication refusal was carried out at the time of reselection of a base station, and repeating an authentication demand and authentication refusal, and the effectiveness that base station selection time amount is shortened is acquired.

[0040] In addition to the description which invention according to claim 3 has from claim 1, invention according to claim 4 forms a switch in a wireless LAN terminal, and a wireless LAN terminal is characterized by starting selection actuation of a base transceiver station periodically, when quality degradation of a power up or radio is detected, or when a user turns on said switch.

[0041] When a wireless terminal acts as powering on of this invention from claim 1 in addition to the effectiveness which invention according to claim 3 has, it can choose a base station automatically, and the effectiveness of preventing the time and effort which starts the base station selection approach with a switch whenever a user is powering on is acquired.

[0042] Moreover, it is possible to choose a base station automatically at the time of quality degradation, connection is changed to a more quality base station at the time of terminal migration, and the effectiveness of preventing decline in the communication link effectiveness by quality degradation is acquired.

[0043] Moreover, although the wireless terminal once chose the remote network base station and moved to the home network after communication link initiation, when the quality of radio does not start automatically [the base station selection approach] above necessary quality, a user is able to start with a switch and the effectiveness of preventing decline in the communication link effectiveness by the overhead of the packet transfer protocol between a remote network and a home network is acquired.

[0044] In addition to the description which invention according to claim 1 to 4 has, invention according to claim 5 is characterized by using the received electrolysis reinforcement from a

base transceiver station as quality of radio. In addition to the effectiveness that invention according to claim 1 to 4 has this invention, when the received electrolysis reinforcement from a base transceiver station is below a threshold, the base station selection approach is started automatically, a hand off is possible to the base station where received electrolysis reinforcement is large, and the effectiveness of preventing decline in the communication link effectiveness by quality degradation of radio is acquired.

[0045] In addition to the description which invention according to claim 1 to 4 has, invention according to claim 6 is characterized by using the error rate of the input signal from a base transceiver station as quality of radio. When the error rate of the input signal from a base transceiver station exceeds a threshold in addition to the effectiveness that invention according to claim 1, 2, 3, or 4 has this invention, the base station selection approach is started automatically, a hand off is possible to the low base station of an error rate, and the effectiveness of preventing decline in the communication link effectiveness by quality degradation of radio is acquired.

[0046] In addition to the description which invention according to claim 1 to 4 has, invention according to claim 7 is characterized by using the traffic load of a base transceiver station as quality of radio. When the traffic load of a base transceiver station exceeds a threshold in addition to the effectiveness that invention according to claim 1 to 4 has this invention, the base station selection approach is started automatically, a hand off is possible and the effectiveness of preventing decline in the communication link effectiveness resulting from the lack of capacity of the circuit by the increment in traffic is acquired to the small base station of a traffic load.

[0047]

[Embodiment of the Invention] Hereafter, each operation gestalt of this invention is explained with reference to a drawing. First, the network configuration in each operation gestalt is shown in drawing 1. Setting to this drawing, for a base transceiver station and 4, a wireless LAN terminal and 5 are [the figure signs 1-3] a router and 61-63. A wireless zone and 7 express a home network and 8 expresses the remote network. A wireless zone forms a subnetwork by independent or plurality.

[0048] As shown in this drawing, two or more subnetworks are connected through a router 5, and a network is constituted. A subnetwork has two or more base transceiver stations, and said base transceiver station has Domain ID and the base station ID showing the subnetwork to which self belongs.

[0049] A subnetwork is classified into the home network which the wireless LAN terminal 4 which moves usually connects, and the remote network connected at a migration place, and calls the base station which belongs the base transceiver station belonging to a home network to a home base station and a remote network a remote base station. By a diagram, besides the figure sign, H is expressed for a home base station and R and a wireless LAN terminal are expressed for the remote base station as S.

[0050] Below, the example at the time of applying the base station selection approach according to claim 1 is explained as a gestalt of operation of the 1st of this invention. A base station transmits the base station ID and Domain ID of a local station with an information signal periodically.

[0051] The base station selection operations sequence of a wireless LAN terminal is shown in drawing 2 as a flow chart. The display of - (S-1) in drawing (S-6) expresses a step, and corresponds with the display under following explanation. A wireless LAN terminal receives the information signal of a fixed period circumference base station, and creates the list of base stations (base station list) which fulfills necessary quality (S-1). The example of a base station list is shown in Table 1.

[0052]

[Table 1]

基地局リスト

品質順位	基地局ID	ドメインID
1	#3	#b
2	#2	#a
3	#1	#a

[0053] Here, it shall be listed by quality order from a list head. When a quality best home base station is chosen when a home base station exists in a base station list (Y of S2-2) (S2-3), and a home base station does not exist (N of S2-2), a quality best remote base station is chosen from remote base stations (S2-4, S2-5). When the base station which fulfills necessary quality does not exist (N of S2-4), it is judged as the service area outside of the circle (S2-6).

[0054] The example of a base station list as shown in this drawing (a), in case the wireless LAN terminal 4 is in the location where the service area of a home base station and a remote base station overlapped as drawing 3 is shown in (b). Although a quality best base station is a remote base station, since the home base station which fulfills necessary quality exists, a wireless LAN terminal chooses home base station #2, and connects. Although the figure sign in this drawing is the same as that of the case of drawing 1, the figure or the alphabet which attached # for ID shows it in this drawing. This is the same about other drawings explained henceforth.

[0055] The example of a base station list as shown in this drawing (a), in case it is the service area of a remote base station and the wireless LAN terminal 4 is in the location of the service area outside of the circle of a home base station as drawing 4 is shown in (b). Since the home base station which fulfills necessary quality does not exist, a wireless LAN terminal chooses remote base station #3, and connects.

[0056] As 2nd operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 2 is explained. A base station transmits the base station ID and Domain ID of a local station with an information signal periodically. Moreover, a base station has the function which attests a wireless LAN terminal, refuses authentication to the wireless LAN terminal which is not registered beforehand, and does not permit a communication link.

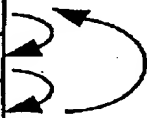
[0057] The base station selection operations sequence of a wireless LAN terminal is shown in drawing 5. The wireless LAN terminal 4 receives the information signal of a fixed period circumference base station, and creates the list of base stations (base station list) which fulfills necessary quality (S5-1). A base station list is equal to Table 1. Moreover, the domain ID of the base station which refused authentication is memorized on an authentication refusal domain list. The example of an authentication refusal domain list is shown in Table 2.

[0058]

[Table 2]

認証拒否ドメインリスト

認証拒否ドメインID
#b
#c
#d



書き込み順

[0059] In addition, for example, the sufficiently larger number of the maximum storage of an authentication refusal domain list than the maximum number of the domain which mutual wireless area overlaps in a certain location, or it can also be taken. It shall memorize, after deleting the oldest domain ID, when the number of the domains ID memorized temporarily exceeds the

maximum number of an authentication refusal domain list.

[0060] When a quality best home base station is chosen when a home base station exists in a base station list (Y of S5-2) (S5-3), and a home base station does not exist (N of S5-2), out of a remote base station, it is base stations other than the domain memorized by the authentication refusal domain list, and authentication is required of a quality best remote base station (S5-4-S5-7).

[0061] In Authentication O.K. (Y of S5-8), base station selection processing is ended. In authentication refusal (N of S5-8), after memorizing the domain ID of this remote base station on an authentication refusal domain list (S5-9), authentication is required of the remote base station of the following quality (S5-10). When the base station which is except DOIMEN memorized by the authentication refusal domain list, and fulfills necessary quality does not exist (S5-11), it is judged as the service area outside of the circle.

[0062] As drawing 6, as the wireless LAN terminal 4 shows in this drawing (a), the example of the base station list of [in cases of being in the location where the service area of a remote base station overlapped], and an authentication refusal domain list is shown in (b). The wireless LAN terminal 4 requires authentication of remote base station #3 with the procedure of drawing 5. In Authentication O.K., it connects with remote base station #3.

[0063] As a gestalt of operation of the 3rd of this invention, the example at the time of applying the base station selection approach according to claim 3 is explained. A base station transmits the base station ID and Domain ID of a local station with an information signal periodically.

[0064] The base station selection operations sequence of a wireless LAN terminal is shown in drawing 7 as a flow chart. The wireless LAN terminal 4 receives the information signal of a fixed period circumference base station, and creates the list of base stations (base station list) which fulfills necessary quality. A base station list is equal to Table 1. Moreover, the domain ID of the base station which refused authentication is memorized on an authentication refusal base station list. An authentication refusal base station list is shown in Table 3.

[0065]

[Table 3]

認証拒否基地局リスト

認証拒否基地局ID	
#1	書き込み順
#2	
#3	

[0066] In addition, mutual wireless area makes the number of the maximum storage of an authentication refusal base station list sufficiently larger than the maximum number of the base station which carries out an OBAHE lap in a certain location. When the number of the base stations ID to memorize exceeds the maximum number of an authentication refusal base station list, after deleting the oldest base station ID, it shall memorize (S7-1).

[0067] When a home base station exists in a base station list (Y of S7-2), it is the base station which is not memorized by the authentication refusal base station list, and authentication is required of a quality best home base station (S7-3-S7-5). In Authentication O.K. (Y of S7-6), base station selection processing is ended. In authentication refusal (N of S7-6), after memorizing the base station ID of this home base station on an authentication refusal base station list (S7-7), authentication is required of the home base station of the following quality (S7-8).

[0068] When the home base station which fulfills necessary quality and is not memorized by the authentication refusal base station list does not exist (Y of S7-9), out of a remote base station, it is the base station which is not memorized by the authentication refusal base station list, and authentication is required of a quality best remote base station (S7-10-S7-13). In Authentication O.K. (Y of S-14), base station selection processing is ended.

[0069] In authentication refusal (N of S7-14), after memorizing the base station ID of this remote

base station on an authentication refusal base station list (S7-15), authentication is required of the remote base station of the following quality (S7-16). When the base station which is a base station which is not memorized by the authentication refusal base station list, and fulfills necessary quality does not exist (Y of S7-17), it is judged as the service area outside of the circle.

[0070] As the wireless LAN terminal 4 shows in this drawing (a) as drawing 8, the example of the base station list of [in cases of being in the location where the service area of a remote base station overlapped], and an authentication refusal base station list is shown in (b). With the procedure of drawing 7, the wireless LAN terminal 4 requires authentication of remote base station #5. In Authentication O.K., it connects with remote base station #5.

[0071] As 4th operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 4 is explained. A base station transmits the base station ID and Domain ID of a local station with an information signal periodically.

[0072] The base station selection operations sequence of the wireless LAN terminal 4 is shown in drawing 9 as a flow chart. The procedure shown in drawing 2, drawing 5, or drawing 7 is applied to base station selection section S9 -5 in drawing. The wireless LAN terminal 4 has the function which supervises communication link quality, a start switch for a user to start the base station selection approach, and a retrieval timer for starting the base station selection approach periodically.

[0073] The wireless LAN terminal 4 starts a base station selection procedure, when a terminal power up (S9 -1) or communication link quality deteriorates below in necessary quality (S9 -2), when a user starts the base station selection approach by the start switch (S9 -3), or when a retrieval timer carries out time over (S9 -4) (S9 -5). A retrieval timer is restarted at the time of the base station end of selection (S9 -7).

[0074] After a wireless LAN terminal connects [in a remote base station] with drawing 10 at B point, the case where it moves to A point is shown. Here, the procedure shown in drawing 2 as a base station selection procedure shall be applied. At A point, since communication link quality with a remote base station fulfills necessary quality, a base station selection procedure is not started by quality degradation. The base station selection procedure which a user turns on a start switch or is shown in drawing 2 by the time over of a retrieval timer is started, and connection is changed to a home base station.

[0075] As 5th operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 5 is explained. In the case of this example, the received electrolysis reinforcement of the input signal from a base station is measured to the base station list creation time in the base station operations sequence shown in drawing 2, drawing 5, or drawing 7, and it makes low order the base station where received electrolysis reinforcement is small at a high order for the base station where received electrolysis reinforcement is large.

[0076] As 6th operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 6 is explained. In the case of this example, the error rate of the input signal from a base station is measured to the base station list creation time in the base station operations sequence shown in drawing 2, drawing 5, or drawing 7, and it makes the large base station of an error rate low order for the small base station of an error rate at a high order.

[0077] As 7th operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 7 is explained. A base station measures the traffic load of a local station, and transmits it with an information signal periodically. In the case of this example, the information signal from a base station is received to the base station list creation time in the base station operations sequence shown in drawing 2 R> 2, drawing 5, or drawing 7, and it makes the large base station of a traffic load low order for the small base station of a traffic load at a high order.

[0078]

[Effect of the Invention] As mentioned above, as explained to the detail, when a wireless terminal moves to a remote network according to this invention, the conventional technical problem are

not connectable with a remote network base station is solved, and there is an advantage which can offer the base transceiver station selection approach which can continue communicative using the packet transfer protocol between a home network and a remote network.

[0079] Moreover, even when a wireless terminal moves to the location where the base station of a home network and the base station area of a remote network overlap and the received electrolysis reinforcement from the base station of a home network fulfills necessary quality, the technical problem of the conventional technique choose the base station of a remote network and connect is solve, and there is an advantage which can offer the base transceiver station selection approach which can control decline in the communication link effectiveness by the overhead of a packet transfer protocol.

[Translation done.]

*** NOTICES ***

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the base transceiver station selection approach in wireless LAN.

[Translation done.]

*** NOTICES ***

JP0 and NCIP1 are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] The roaming approach of the existing wireless LAN is explained below as a conventional technique 1. The roaming approach is supported in WaveLAN of a 2.4GHz band wireless LAN product. By this approach, a base transceiver station has the domain ID for identifying the subnetwork to which the base station ID and local station for identifying a base station belong. A wireless LAN terminal memorizes beforehand the domain ID of the subnetwork which a local station usually connects.

[0003] When it acts as powering on, or when received field strength deteriorates during a communication link below at a threshold, in accordance with the memorized domain ID, a wireless LAN terminal chooses the largest base station of received field strength, and connects. The base station which is not in agreement with the memorized domain ID is not chosen.

(Refer to reference: "NCR Japan, and "WaveLAN system WaveLAN / PCMCIA card installation and actuation"")

[0004] Next, the hand off approach of an automobile and a cellular-phone system is explained below as a conventional technique 2. The hand off approach is supported in the automobile and the cellular-phone system. By this approach, a base transceiver station has a simultaneous paging area number for identifying the simultaneous paging area to which the base station ID and local station for identifying a base station belong. A terminal does not memorize beforehand the simultaneous paging area number which a local station usually connects.

[0005] When it acts as powering on, or when received field strength is below a threshold and the error rate of an input signal exceeds a threshold during a communication link, regardless of simultaneous paging area, a terminal chooses the largest base station of received field strength, and connects.

(Refer to reference: "Research & Development Center for Radio System and "digital method land mobile radiotelephone system system standard RCRSTD-27"")

[Translation done.]

*** NOTICES ***

JPO and NCIP are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, as explained to the detail, when a wireless terminal moves to a remote network according to this invention, the conventional technical problem are not connectable with a remote network base station is solved, and there is an advantage which can offer the base transceiver station selection approach which can continue communicative using the packet transfer protocol between a home network and a remote network.

[0079] Moreover, even when a wireless terminal moves to the location where the base station of a home network and the base station area of a remote network overlap and the received electrolysis reinforcement from the base station of a home network fulfills necessary quality, the technical problem of the conventional technique choose the base station of a remote network and connect is solve, and there is an advantage which can offer the base transceiver station selection approach which can control decline in the communication link effectiveness by the overhead of a packet transfer protocol.

[Translation done.]

*** NOTICES ***

JP0 and NCIP1 are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] A wireless LAN terminal can consider the use gestalt which moves ranging over between a remote network etc. and subnetworks from a home network from migratory [the]. At this time, the packet transfer between a remote network and a home network is performed, and also while connecting with a remote network, the packet transfer protocol (for example, Mobile IP) which enables the same communication link as the time of home network connection is proposed. In order that this protocol might carry out capsuling of the packet and might transmit between a remote network and a home network, it had the technical problem that communication link effectiveness fell by the overhead.

[0007] Moreover, by the roaming approach of the conventional technique 1 mentioned above, since it cannot connect with a base transceiver station when a wireless LAN terminal moves to the subnetwork from which Domain ID differs, the problem that it cannot communicate even if it mounts said packet transfer protocol by the network side arises.

[0008] Even when the hand off approach of the above-mentioned conventional technique 2 is applied to the base station selection approach of wireless LAN, a wireless LAN terminal moves it to the location where the base station of a home network and the base station area of a remote network overlap and the received field strength from the base station of a home network fulfills necessary quality, the case which chooses the base station of a remote network and is connected arises.

[0009] Since the packet transfer protocol between a home network and a remote network is performed when a wireless LAN terminal connects with a remote network, the problem that a large next door and communication link effectiveness fall [an overhead] arises.

[0010] When a wireless terminal moves to a remote network, this invention solves the technical problem that it is not connectable in a remote network base station to the 1st, and aims at offering the base transceiver station selection approach which can continue communicative using the packet transfer protocol between a home network and a remote network to it.

[0011] The technical problem that 2nd choose the base station of a remote network and it connects even when a wireless terminal moves to the location where the base station of a home network and the base station area of a remote network overlap and the received field strength from the base station of a home network fulfills necessary quality is solved, and it aims at offering the base transceiver station selection approach which can control decline in the communication link effectiveness by the overhead of a packet transfer protocol.

[Translation done.]

*** NOTICES ***

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] According to this invention, an above-mentioned technical problem is solved by the means indicated to said claim.

[0013] Namely, invention according to claim 1 connects between two or more subnetworks identified by Domain ID, and constitutes one network. Said subnetwork has two or more base transceiver stations, and said base transceiver station has said domain ID of said subnetwork which self connects. It sets to the base transceiver station selection approach which chooses one from said two or more base transceiver stations located in the location which fulfills the necessary quality of radio in case it communicates, and the wireless terminal which communicates with said network through said base transceiver station is [0014]. Said wireless terminal memorizes the domain ID of a home network beforehand, and chooses the base transceiver station in which quality is most excellent with the domain ID same when the base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists as a home network by classifying into the home network to which said wireless terminal which moves connects a subnetwork most frequently, and the remote network which said wireless terminal connects at a migration place, and it is [0015]. When a base transceiver station with a domain ID which the base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist, and is different from a home network exists, it is characterized by choosing the most excellent base transceiver station of quality with a different domain ID from a home network.

[0016] With the conventional technique, quality chooses a most excellent base transceiver station with the domain ID same when the base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists as a home network, and it is [0017]. When a base transceiver station with a domain ID which the base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist, and is different from a home network exists, the points which choose the most excellent base transceiver station of quality differ with a different domain ID from a home network.

[0018] When the home network base station which fulfills necessary quality does not exist, this invention can choose the remote network base station which fulfills necessary quality, and also when a wireless terminal moves to a remote network, it can acquire the effectiveness which can continue a communication link with a packet transfer protocol.

[0019] Moreover, when a wireless terminal moves to the location where the area of a home network base station and a remote network base station overlapped, it is possible to give priority to and choose a home network base station, and the effectiveness of preventing decline in the communication link effectiveness by the overhead of the packet transfer protocol between a remote network and a home network is acquired.

[0020] Invention according to claim 2 connects between two or more subnetworks identified by Domain ID, and constitutes one network. The base station ID which said subnetwork has two or more base transceiver stations, and identifies Domain ID and each base transceiver station of said subnetwork to which self connects said base transceiver station Said wireless terminal is

set to the base transceiver station selection approach which chooses one from said two or more base transceiver stations in the location which fulfills the necessary quality of radio in case it communicates by having the function which attests the wireless terminal which communicates with said network through this base transceiver station, and it is [0021]. By classifying into the home network to which said wireless terminal which moves connects a subnetwork most frequently, and the remote network which said wireless terminal connects at a migration place, said wireless terminal memorizes the domain ID of a home network beforehand, and has the function to memorize the domain ID of the base transceiver station by which authentication refusal was carried out on an authentication refusal domain list, and it is [0022]. When the base transceiver station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists With the same domain ID as a home network, quality chooses a most excellent base transceiver station, and it connects. The base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist. And when a base station [**** / a connection-refusal domain list / un-] exists with a different domain ID from a home network Authentication is required of the base transceiver station in which has a different domain ID from a home network, and has not registered with a connection-refusal domain list, and quality is most excellent, and it is [0023]. When connection is refused as a result of authentication, after adding the domain ID of this base transceiver station to a connection-refusal domain list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal domain list / un-] exists When the actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent is repeated and connection is permitted as a result of authentication, it is characterized by choosing this base transceiver station and connecting.

[0024] It has the function to memorize the domain ID of the base station where authentication refusal of said wireless terminal was carried out with the conventional technique on an authentication refusal domain list, and with the domain ID same when the base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio exists as a home network, quality chooses a most excellent base transceiver station, and it connects, and is [0025]. Authentication is required of the base transceiver station in which has a different domain ID from a home network, and has not registered with a connection-refusal domain list, and quality is most excellent when a base station [**** / a connection-refusal domain list / un-] exists with a domain ID which the base station which has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio does not exist, and is different from a home network, and it is [0026]. When connection is refused as a result of authentication, after adding the domain ID of this base transceiver station to a connection-refusal domain list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal domain list / un-] exists When the actuation which requires authentication of the base transceiver station in which has a different domain ID from a home network, and has not registered with a connection-refusal base station list, and quality is most excellent is repeated and connection is permitted as a result of authentication, it differs in the point of having the configuration which chooses this base transceiver station and is connected.

[0027] Authentication of the wireless terminal which has moved by the remote network side in addition to an effect of the invention according to claim 1 is possible for this invention, and the effectiveness of preventing an unspecified wireless terminal accessing a network is acquired. Moreover, the domain ID of the base station by which authentication refusal was carried out is memorized, a wireless terminal can be excepted from base station selection, it prevents choosing again the base station by which authentication refusal was carried out at the time of reselection of a base station, and other base stations linked to the same remote network, and repeating an authentication demand and authentication refusal, and the effectiveness that base station

selection time amount is shortened is acquired.

[0028] Invention according to claim 3 connects between two or more subnetworks identified by Domain ID, and constitutes one network. Said base transceiver station has the function which attests the wireless terminal which communicates with said network through the base station ID and this base transceiver station which identify self Domain ID and each base transceiver station of said subnetwork which belongs by said subnetwork having two or more base transceiver stations, and it is [0029]. In the base transceiver station selection approach which chooses one from two or more base transceiver stations located in the location which fulfills the necessary quality of radio in case a wireless terminal communicates The home network to which said wireless terminal which moves connects a subnetwork most frequently, By classifying into the remote network which said wireless terminal connects at a migration place, said wireless terminal memorizes the domain ID of a home network beforehand, and has the function to memorize the base station ID by which authentication refusal was carried out on an authentication refusal base station list, and it is [0030]. Authentication is required of the base transceiver station in which has the same domain ID as a home network, and has not registered with a connection-refusal base station list, and quality is most excellent when it has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists, and it is [0031]. When connection is refused as a result of authentication, after adding the base station ID of this base transceiver station to a connection-refusal base station list, When it has the same domain ID as a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists The actuation which requires authentication of the base transceiver station in which has the same domain ID as a home network, and has not registered with a connection-refusal base station list, and quality is most excellent is repeated, and it is [0032]. The base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent when a base station [**** / a connection-refusal base station list / un-] exists with a domain ID which it has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio, and a base station [**** / a connection-refusal base station list / un-] does not exist, and is different from a home network is chosen, authentication is required, and it is [0033]. When connection is refused as a result of authentication, after adding the base station ID of this base transceiver station to a connection-refusal base station list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists When the actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent is repeated and connection is permitted as a result of authentication, it is characterized by choosing this base transceiver station.

[0034] Authentication requires of the base transceiver station in which has the function memorize the base station ID where authentication refusal of said wireless terminal was carried out to the conventional technique on an authentication refusal base station list, and has the same domain ID as a home network in two or more base transceiver stations which fulfill the necessary quality of radio, and has not registered with a connection-refusal base station list with the domain ID same when a base station [**** / a connection-refusal base station list / un-] exists as a home network, and quality is most excellent, and it is [0035]. The actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with the same domain ID as a home network, and quality is most excellent when it has the same domain ID as a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists after adding the base station ID of this base transceiver station to a connection-refusal base station list, when connection is refused as a result of authentication repeats, and it is [0036]. Authentication is required of the base transceiver station in which has not registered with a connection-refusal base station list with a

different domain ID from a home network, and quality is most excellent when a base station [**** / a connection-refusal base station list / un-] exists with a domain ID which a base station [**** / a connection-refusal base station list / un-] does not exist with the domain ID same in two or more base transceiver stations which fulfill the necessary quality of radio as a home network, and is different from a home network, and it is [0037]. When connection is refused as a result of authentication, after adding the base station ID of this base transceiver station to a connection-refusal base station list, When it has a different domain ID from a home network again in two or more base transceiver stations which fulfill the necessary quality of radio and a base station [**** / a connection-refusal base station list / un-] exists The actuation which requires authentication of the base transceiver station in which has not registered with a connection-refusal base station list with a different domain ID from a home network, and quality is most excellent is repeated, and when connection is permitted as a result of authentication, it differs in the point of having the configuration which chooses this base transceiver station.

[0038] Authentication of the wireless terminal which has moved by the remote network side in addition to an effect of the invention according to claim 1 is possible for this invention, and the effectiveness of preventing an unspecified wireless terminal accessing a network is acquired. Moreover, authentication authorization or refusal of a wireless LAN terminal can be set up for every base station, and the effectiveness which can limit the base station in which the wireless terminal which has moved by the remote network side is held is acquired.

[0039] Moreover, a wireless terminal memorizes the base station ID by which authentication refusal was carried out, excepting from base station selection is possible, it prevents choosing again the base station by which authentication refusal was carried out at the time of reselection of a base station, and repeating an authentication demand and authentication refusal, and the effectiveness that base station selection time amount is shortened is acquired.

[0040] In addition to the description which invention according to claim 3 has from claim 1, invention according to claim 4 forms a switch in a wireless LAN terminal, and a wireless LAN terminal is characterized by starting selection actuation of a base transceiver station periodically, when quality degradation of a power up or radio is detected, or when a user turns on said switch.

[0041] When a wireless terminal acts as powering on of this invention from claim 1 in addition to the effectiveness which invention according to claim 3 has, it can choose a base station automatically, and the effectiveness of preventing the time and effort which starts the base station selection approach with a switch whenever a user is powering on is acquired.

[0042] Moreover, it is possible to choose a base station automatically at the time of quality degradation, connection is changed to a more quality base station at the time of terminal migration, and the effectiveness of preventing decline in the communication link effectiveness by quality degradation is acquired.

[0043] Moreover, although the wireless terminal once chose the remote network base station and moved to the home network after communication link initiation, when the quality of radio does not start automatically [the base station selection approach] above necessary quality, a user is able to start with a switch and the effectiveness of preventing decline in the communication link effectiveness by the overhead of the packet transfer protocol between a remote network and a home network is acquired.

[0044] In addition to the description which invention according to claim 1 to 4 has, invention according to claim 5 is characterized by using the received electrolysis reinforcement from a base transceiver station as quality of radio. In addition to the effectiveness that invention according to claim 1 to 4 has this invention, when the received electrolysis reinforcement from a base transceiver station is below a threshold, the base station selection approach is started automatically, a hand off is possible to the base station where received electrolysis reinforcement is large, and the effectiveness of preventing decline in the communication link effectiveness by quality degradation of radio is acquired.

[0045] In addition to the description which invention according to claim 1 to 4 has, invention according to claim 6 is characterized by using the error rate of the input signal from a base

transceiver station as quality of radio. When the error rate of the input signal from a base transceiver station exceeds a threshold in addition to the effectiveness that invention according to claim 1, 2, 3, or 4 has this invention, the base station selection approach is started automatically, a hand off is possible to the low base station of an error rate, and the effectiveness of preventing decline in the communication link effectiveness by quality degradation of radio is acquired.

[0046] In addition to the description which invention according to claim 1 to 4 has, invention according to claim 7 is characterized by using the traffic load of a base transceiver station as quality of radio. When the traffic load of a base transceiver station exceeds a threshold in addition to the effectiveness that invention according to claim 1 to 4 has this invention, the base station selection approach is started automatically, a hand off is possible and the effectiveness of preventing decline in the communication link effectiveness resulting from the lack of capacity of the circuit by the increment in traffic is acquired to the small base station of a traffic load.

[0047]

[Embodiment of the Invention] Hereafter, each operation gestalt of this invention is explained with reference to a drawing. First, the network configuration in each operation gestalt is shown in drawing 1. Setting to this drawing, for a base transceiver station and 4, a wireless LAN terminal and 5 are [the figure signs 1-3] a router and 61-63. A wireless zone and 7 express a home network and 8 expresses the remote network. A wireless zone forms a subnetwork by independent or plurality.

[0048] As shown in this drawing, two or more subnetworks are connected through a router 5, and a network is constituted. A subnetwork has two or more base transceiver stations, and said base transceiver station has Domain ID and the base station ID showing the subnetwork to which self belongs.

[0049] A subnetwork is classified into the home network which the wireless LAN terminal 4 which moves usually connects, and the remote network connected at a migration place, and calls the base station which belongs the base transceiver station belonging to a home network to a home base station and a remote network a remote base station. By a diagram, besides the figure sign, H is expressed for a home base station and R and a wireless LAN terminal are expressed for the remote base station as S.

[0050] Below, the example at the time of applying the base station selection approach according to claim 1 is explained as a gestalt of operation of the 1st of this invention. A base station transmits the base station ID and Domain ID of a local station with an information signal periodically.

[0051] The base station selection operations sequence of a wireless LAN terminal is shown in drawing 2 as a flow chart. The display of - (S-1) in drawing (S-6) expresses a step, and corresponds with the display under following explanation. A wireless LAN terminal receives the information signal of a fixed period circumference base station, and creates the list of base stations (base station list) which fulfills necessary quality (S-1). The example of a base station list is shown in Table 1.

[0052]

[Table 1]

基地局リスト

品質順位	基地局ID	ドメインID
1	#3	#b
2	#2	#a
3	#1	#a

[0053] Here, it shall be listed by quality order from a list head. When a quality best home base station is chosen when a home base station exists in a base station list (Y of S2-2) (S2-3), and a home base station does not exist (N of S2-2), a quality best remote base station is chosen from remote base stations (S2-4, S2-5). When the base station which fulfills necessary quality does not exist (N of S2-4), it is judged as the service area outside of the circle (S2-6).

[0054] The example of a base station list as shown in this drawing (a), in case the wireless LAN terminal 4 is in the location where the service area of a home base station and a remote base station overlapped as drawing 3 is shown in (b). Although a quality best base station is a remote base station, since the home base station which fulfills necessary quality exists, a wireless LAN terminal chooses home base station #2, and connects. Although the figure sign in this drawing is the same as that of the case of drawing 1, the figure or the alphabet which attached # for ID shows it in this drawing. This is the same about other drawings explained henceforth.

[0055] The example of a base station list as shown in this drawing (a), in case it is the service area of a remote base station and the wireless LAN terminal 4 is in the location of the service area outside of the circle of a home base station as drawing 4 is shown in (b). Since the home base station which fulfills necessary quality does not exist, a wireless LAN terminal chooses remote base station #3, and connects.

[0056] As 2nd operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 2 is explained. A base station transmits the base station ID and Domain ID of a local station with an information signal periodically. Moreover, a base station has the function which attests a wireless LAN terminal, refuses authentication to the wireless LAN terminal which is not registered beforehand, and does not permit a communication link.

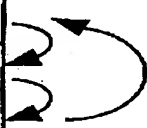
[0057] The base station selection operations sequence of a wireless LAN terminal is shown in drawing 5. The wireless LAN terminal 4 receives the information signal of a fixed period circumference base station, and creates the list of base stations (base station list) which fulfills necessary quality (S5-1). A base station list is equal to Table 1. Moreover, the domain ID of the base station which refused authentication is memorized on an authentication refusal domain list. The example of an authentication refusal domain list is shown in Table 2.

[0058]

[Table 2]

認証拒否ドメインリスト

認証拒否ドメインID
#b
#c
#d



書き込み順

[0059] In addition, for example, the sufficiently larger number of the maximum storage of an authentication refusal domain list than the maximum number of the domain which mutual wireless area overlaps in a certain location, or it can also be taken. It shall memorize, after deleting the oldest domain ID, when the number of the domains ID memorized temporarily exceeds the maximum number of an authentication refusal domain list.

[0060] When a quality best home base station is chosen when a home base station exists in a base station list (Y of S5-2) (S5-3), and a home base station does not exist (N of S5-2), out of a remote base station, it is base stations other than the domain memorized by the authentication refusal domain list, and authentication is required of a quality best remote base station (S5-4-S5-7).

[0061] In Authentication O.K. (Y of S5-8), base station selection processing is ended. In authentication refusal (N of S5-8), after memorizing the domain ID of this remote base station on an authentication refusal domain list (S5-9), authentication is required of the remote base station of the following quality (S5-10). When the base station which is except DOIMEN memorized by the authentication refusal domain list, and fulfills necessary quality does not exist

(S5-11), it is judged as the service area outside of the circle.

[0062] As drawing 6, as the wireless LAN terminal 4 shows in this drawing (a), the example of the base station list of [in cases of being in the location where the service area of a remote base station overlapped], and an authentication refusal domain list is shown in (b). The wireless LAN terminal 4 requires authentication of remote base station #3 with the procedure of drawing 5. In Authentication O.K., it connects with remote base station #3.

[0063] As a gestalt of operation of the 3rd of this invention, the example at the time of applying the base station selection approach according to claim 3 is explained. A base station transmits the base station ID and Domain ID of a local station with an information signal periodically.

[0064] The base station selection operations sequence of a wireless LAN terminal is shown in drawing 7 as a flow chart. The wireless LAN terminal 4 receives the information signal of a fixed period circumference base station, and creates the list of base stations (base station list) which fulfills necessary quality. A base station list is equal to Table 1. Moreover, the domain ID of the base station which refused authentication is memorized on an authentication refusal base station list. An authentication refusal base station list is shown in Table 3.

[0065]

[Table 3]

認証拒否基地局リスト

認証拒否基地局ID	
#1	書き込み順
#2	
#3	

[0066] In addition, mutual wireless area makes the number of the maximum storage of an authentication refusal base station list sufficiently larger than the maximum number of the base station which carries out an OBAHE lap in a certain location. When the number of the base stations ID to memorize exceeds the maximum number of an authentication refusal base station list, after deleting the oldest base station ID, it shall memorize (S7-1).

[0067] When a home base station exists in a base station list (Y of S7-2), it is the base station which is not memorized by the authentication refusal base station list, and authentication is required of a quality best home base station (S7-3-S7-5). In Authentication O.K. (Y of S7-6), base station selection processing is ended. In authentication refusal (N of S7-6), after memorizing the base station ID of this home base station on an authentication refusal base station list (S7-7), authentication is required of the home base station of the following quality (S7-8).

[0068] When the home base station which fulfills necessary quality and is not memorized by the authentication refusal base station list does not exist (Y of S7-9), out of a remote base station, it is the base station which is not memorized by the authentication refusal base station list, and authentication is required of a quality best remote base station (S7-10-S7-13). In Authentication O.K. (Y of S-14), base station selection processing is ended.

[0069] In authentication refusal (N of S7-14), after memorizing the base station ID of this remote base station on an authentication refusal base station list (S7-15), authentication is required of the remote base station of the following quality (S7-16). When the base station which is a base station which is not memorized by the authentication refusal base station list, and fulfills necessary quality does not exist (Y of S7-17), it is judged as the service area outside of the circle.

[0070] As the wireless LAN terminal 4 shows in this drawing (a) as drawing 8, the example of the base station list of [in cases of being in the location where the service area of a remote base station overlapped], and an authentication refusal base station list is shown in (b). With the procedure of drawing 7, the wireless LAN terminal 4 requires authentication of remote base station #5. In Authentication O.K., it connects with remote base station #5.

[0071] As 4th operation gestalt of this invention, the example at the time of applying the base

station selection approach according to claim 4 is explained. A base station transmits the base station ID and Domain ID of a local station with an information signal periodically.

[0072] The base station selection operations sequence of the wireless LAN terminal 4 is shown in drawing 9 as a flow chart. The procedure shown in drawing 2 , drawing 5 , or drawing 7 is applied to base station selection section S9 -5 in drawing. The wireless LAN terminal 4 has the function which supervises communication link quality, a start switch for a user to start the base station selection approach, and a retrieval timer for starting the base station selection approach periodically.

[0073] The wireless LAN terminal 4 starts a base station selection procedure, when a terminal power up (S9 -1) or communication link quality deteriorates below in necessary quality (S9 -2), when a user starts the base station selection approach by the start switch (S9 -3), or when a retrieval timer carries out time over (S9 -4) (S9 -5). A retrieval timer is restarted at the time of the base station end of selection (S9 -7).

[0074] After a wireless LAN terminal connects [in a remote base station] with drawing 10 at B point, the case where it moves to A point is shown. Here, the procedure shown in drawing 2 as a base station selection procedure shall be applied. At A point, since communication link quality with a remote base station fulfills necessary quality, a base station selection procedure is not started by quality degradation. The base station selection procedure which a user turns on a start switch or is shown in drawing 2 by the time over of a retrieval timer is started, and connection is changed to a home base station.

[0075] As 5th operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 5 is explained. In the case of this example, the received electrolysis reinforcement of the input signal from a base station is measured to the base station list creation time in the base station operations sequence shown in drawing 2 , drawing 5 , or drawing 7 , and it makes low order the base station where received electrolysis reinforcement is small at a high order for the base station where received electrolysis reinforcement is large.

[0076] As 6th operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 6 is explained. In the case of this example, the error rate of the input signal from a base station is measured to the base station list creation time in the base station operations sequence shown in drawing 2 , drawing 5 , or drawing 7 , and it makes the large base station of an error rate low order for the small base station of an error rate at a high order.

[0077] As 7th operation gestalt of this invention, the example at the time of applying the base station selection approach according to claim 7 is explained. A base station measures the traffic load of a local station, and transmits it with an information signal periodically. In the case of this example, the information signal from a base station is received to the base station list creation time in the base station operations sequence shown in drawing 2 R> 2, drawing 5 , or drawing 7 , and it makes the large base station of a traffic load low order for the small base station of a traffic load at a high order.

[Translation done.]

*** NOTICES ***

JP0 and NCIP1 are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the network configuration which applies this invention.

[Drawing 2] It is the flow chart showing the base station selection procedure of the wireless LAN terminal in the gestalt of the 1st operation.

[Drawing 3] It is drawing (the 1) explaining the gestalt of the 1st operation.

[Drawing 4] It is drawing (the 2) explaining the gestalt of the 1st operation.

[Drawing 5] It is the flow chart showing the base station selection procedure of the wireless LAN terminal in the gestalt of the 2nd operation.

[Drawing 6] It is drawing explaining the gestalt of the 2nd operation.

[Drawing 7] It is the flow chart showing the base station selection procedure of the wireless LAN terminal in the gestalt of the 3rd operation.

[Drawing 8] It is drawing explaining the gestalt of the 3rd operation.

[Drawing 9] It is the flow chart showing the base station selection procedure of the wireless LAN terminal in the gestalt of the 4th operation.

[Drawing 10] It is drawing explaining the gestalt of the 4th operation.

[Description of Notations]

1-3 Base transceiver station

4 Wireless LAN Terminal

5 Router

61 - 63 Wireless Zone

7 Home Network

8, 81, 82 Remote network

[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平11-205342

(43) 公開日 平成11年(1999) 7月30日

(51) Int.Cl.* 識別記号

H 0 4 L 12/28

H 0 4 B 7/26

H 0 4 Q 7/38

F I

H 0 4 L 11/00

H 0 4 B 7/26

3 1 0 B

M

1 0 9 N

審査請求 有 請求項の数 7 O L (全 12 頁)

(21) 出願番号 特願平10-8485

(22) 出願日 平成10年(1998) 1月20日

(71) 出願人 000004226

日本電信電話株式会社

東京都新宿区西新宿三丁目19番2号

(72) 発明者 市川 武男

東京都新宿区西新宿三丁目19番2号 日本
電信電話株式会社内

(72) 発明者 高梨 斉

東京都新宿区西新宿三丁目19番2号 日本
電信電話株式会社内

(72) 発明者 飯塚 正孝

東京都新宿区西新宿三丁目19番2号 日本
電信電話株式会社内

(74) 代理人 弁理士 本間 崇

最終頁に続く

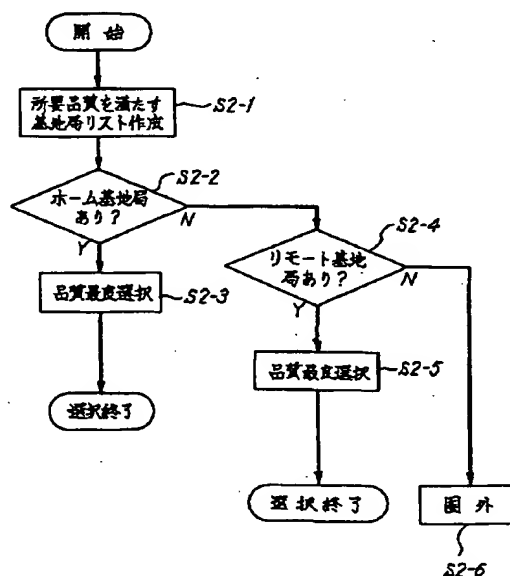
(54) 【発明の名称】 無線基地局選択方法

(57) 【要約】

【課題】 無線LANにおける無線基地局の選択方法に関し、無線端末がホームネットワークとリモートネットワークとにまたがって移動したときでも通信の継続が可能で、オーバーヘッドによる通信効率の低下を生ずることのない無線基地局選択方法の実現を目的とする。

【構成】 サブネットワークを、移動する無線端末が最も頻繁に接続するホームネットワークと、無線端末が移動先で接続するリモートネットワークに分類し、無線端末はホームネットワークのドメインIDをあらかじめ記憶し、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ品質が最も優れる無線基地局を選択し、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在せず、かつホームネットワークと異なるドメインIDを持つ無線基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ品質の最も優れる無線基地局を選択するように構成する。

第1の実施の形態における無線LAN端末の
基地局選択手順を示す流れ図



【特許請求の範囲】

【請求項1】 ドメインIDにより識別される複数のサブネットワーク間を接続して1つのネットワークを構成し、

前記サブネットワークは複数の無線基地局を持ち、該無線基地局は自己の接続する前記サブネットワークの前記ドメインIDと各無線基地局を識別する基地局IDを持ち、

前記無線基地局を介して前記ネットワークと通信を行う無線端末は、通信を行う際に、無線通信の所要品質を満たす位置にある複数の前記無線基地局の中から1つを選択する無線基地局選択方法において、

サブネットワークを、移動する前記無線端末が最も頻繁に接続するホームネットワークと、前記無線端末が移動先で接続するリモートネットワークとに分類し、

前記無線端末はホームネットワークのドメインIDをあらかじめ記憶し、

無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ品質が最も優れる無線基地局を選択し、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在せず、かつホームネットワークと異なるドメインIDを持つ無線基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ品質の最も優れる無線基地局を選択することを特徴とする無線基地局選択方法。

【請求項2】 ドメインIDにより識別される複数のサブネットワーク間を接続して1つのネットワークを構成し、

前記サブネットワークは複数の無線基地局を持ち、該無線基地局は自己の接続する前記サブネットワークのドメインIDと各無線基地局を識別する基地局IDと、該無線基地局を介して前記ネットワークと通信を行う無線端末を認証する機能を持ち、

前記無線端末は通信を行う際に、無線通信の所要品質を満たす位置にある複数の前記無線基地局の中から1つを選択する無線基地局選択方法において、

サブネットワークを、移動する前記無線端末が最も頻繁に接続するホームネットワークと、前記無線端末が移動先で接続するリモートネットワークとに分類し、

前記無線端末はホームネットワークのドメインIDをあらかじめ記憶し、また認証拒否された無線基地局のドメインIDを認証拒否ドメインリストに記憶する機能を持ち、

無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ品質が最も優れる無線基地局を選択して

接続し、

無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在せず、かつホームネットワークと異なるドメインIDを持ちかつ接続拒否ドメインリストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ接続拒否ドメインリストに未登録でかつ品質が最も優れる無線基地局に認証を要求し、

認証の結果接続を拒否された場合は該無線基地局のドメインIDを接続拒否ドメインリストに追加した後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと異なるドメインIDを持ち、かつ接続拒否ドメインリストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返し、認証の結果接続を許可された場合は該無線基地局を選択して接続することを特徴とする無線基地局選択方法。

【請求項3】 ドメインIDにより識別される複数のサブネットワーク間を接続して1つのネットワークを構成し、

前記サブネットワークは複数の無線基地局を持ち、該無線基地局は自己の所属する前記サブネットワークのドメインIDと各無線基地局を識別する基地局IDと、該無線基地局を介して前記ネットワークと通信を行う無線端末を認証する機能を持ち、

無線端末は通信を行う際に、無線通信の所要品質を満たす複数の無線基地局の中から1つを選択する無線基地局選択方法において、

サブネットワークを、移動する前記無線端末が最も頻繁に接続するホームネットワークと、前記無線端末が移動先で接続するリモートネットワークとに分類し、

前記無線端末はホームネットワークのドメインIDをあらかじめ記憶し、また認証拒否された基地局IDを認証拒否基地局リストに記憶する機能を持ち、

無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求し、

認証の結果接続を拒否された場合は該無線基地局の基地局IDを接続拒否基地局リストに追加した後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返し、

無線通信の所要品質を満たす複数の無線基地局の中にホ

10

20

30

40

50

ームネットワークと同じドメインIDを持ちかつ接続拒否基地局リストに未登録な基地局が存在せず、かつホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録でかつ品質が最も優れる無線

基地局を選択して認証を要求し、
認証の結果接続を拒否された場合は該無線基地局の基地局IDを接続拒否基地局リストに追加した後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと異なるドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返し、
認証の結果接続を許可された場合は該無線基地局を選択することを特徴とする無線基地局選択方法。

【請求項4】 無線端末にスイッチを設け、前記無線端末は電源投入時、または無線通信の品質劣化を検出したとき、または前記スイッチをユーザがONしたとき、または周期的に、無線基地局選択動作を起動することを特徴とする請求項1～請求項3のいずれか1項に記載の無線基地局選択方法。

【請求項5】 無線通信の品質として、無線基地局からの受信電界強度を用いることを特徴とする請求項1～請求項4のいずれか1項に記載の無線基地局選択方法。

【請求項6】 無線通信の品質として、無線基地局からの受信信号の誤り率を用いることを特徴とする請求項1～請求項4のいずれか1項に記載の無線基地局選択方法。

【請求項7】 無線通信の品質として、無線基地局のトラフィック負荷を用いることを特徴とする請求項1～請求項4のいずれか1項に記載の無線基地局選択方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、無線LANにおける無線基地局選択方法に関するものである。

【0002】

【従来の技術】従来技術1として既存無線LANのローミング方法について以下に説明する。2.4GHz帯無線LAN製品のWaveLANでは、ローミング方法をサポートしている。この方法では、無線基地局を識別するための基地局IDと自局が所属するサブネットワークを識別するためのドメインIDを持つ。無線LAN端末は自局が通常接続するサブネットワークのドメインIDをあらかじめ記憶する。

【0003】無線LAN端末は電源投入したとき、または通信中に受信電界強度が閾値以下に劣化したとき、記憶したドメインIDと一致し、かつ受信電界強度の最も大きい基地局を選択して接続する。記憶したドメインID

Dと一致しない基地局は選択しない。

(文献:「日本NCR, "WaveLANシステム WaveLAN/PCMCIAカードインストール及び操作"」参照)

【0004】次に従来技術2として自動車・携帯電話システムのハンドオフ方法について以下に説明する。自動車・携帯電話システムでは、ハンドオフ方法をサポートしている。この方法では、無線基地局は、基地局を識別するための基地局IDと、自局が所属する一斉呼び出しエリアを識別するための一斉呼び出しエリア番号を持つ。端末は、自局が通常接続する一斉呼び出しエリア番号をあらかじめ記憶しない。

【0005】端末は、電源投入したとき、または通信中に受信電界強度が閾値以下で、かつ受信信号の誤り率が閾値を越えたとき、一斉呼び出しエリアに関係なく受信電界強度の最も大きい基地局を選択して接続する。

(文献:「電波システム開発センタ, "デジタル方式自動車電話システムシステム標準規格 RCRSTD-27"」参照)

【0006】

【発明が解決しようとする課題】無線LAN端末は、その移動性からホームネットワークからリモートネットワークへ等、サブネットワーク間をまたいで移動する利用形態が考えられる。このとき、リモートネットワークとホームネットワーク間のパケット転送を行い、リモートネットワークに接続中もホームネットワーク接続時と同様な通信を可能とするパケット転送プロトコル(例えばMobile IP)が提案されている。本プロトコルは、リモートネットワークとホームネットワーク間を、パケットをカプセリングして転送するため、オーバーヘッドにより通信効率が低下するという課題があった。

【0007】また、前述した従来技術1のローミング方法では、無線LAN端末が、ドメインIDの異なるサブネットワークに移動したとき、無線基地局に接続できないため、ネットワーク側で前記パケット転送プロトコルを実装しても通信できないという問題が生じる。

【0008】前述の従来技術2のハンドオフ方法を、無線LANの基地局選択方法に適用した場合、ホームネットワークの基地局とリモートネットワークの基地局エリアがオーバーラップしている位置に無線LAN端末が移動したとき、ホームネットワークの基地局からの受信電界強度が所要品質を満たしている場合でも、リモートネットワークの基地局を選択して接続するケースが生じる。

【0009】無線LAN端末がリモートネットワークに接続した場合は、ホームネットワークとリモートネットワーク間のパケット転送プロトコルが行われるため、オーバーヘッドが大となり、通信効率が低下するという問題が生じる。

【0010】本発明は、第1に、無線端末がリモートネットワークに移動したとき、リモートネットワーク基地

10

20

30

40

50

局に接続できないという課題を解決し、ホームネットワークとリモートネットワーク間のパケット転送プロトコルを利用して通信の継続が可能な無線基地局選択方法を提供することを目的とする。

【0011】第2に、ホームネットワークの基地局とリモートネットワークの基地局エリアがオーバーラップしている位置に無線端末が移動したとき、ホームネットワークの基地局からの受信電界強度が所要品質を満たしている場合でも、リモートネットワークの基地局を選択して接続するという課題を解決し、パケット転送プロトコルのオーバーヘッドによる通信効率の低下を抑制可能な無線基地局選択方法を提供することを目的とする。

【0012】

【課題を解決するための手段】本発明によれば、上述の課題は前記特許請求の範囲に記載した手段により解決される。

【0013】すなわち、請求項1に記載の発明は、ドメインIDにより識別される複数のサブネットワーク間を接続して1つのネットワークを構成し、前記サブネットワークは複数の無線基地局を持ち、前記無線基地局は自己の接続する前記サブネットワークの前記ドメインIDを持ち、前記無線基地局を介して前記ネットワークと通信を行う無線端末は、通信を行う際に、無線通信の所要品質を満たす位置にある複数の前記無線基地局の中から1つを選択する無線基地局選択方法において、

【0014】サブネットワークを、移動する前記無線端末が最も頻繁に接続するホームネットワークと、前記無線端末が移動先で接続するリモートネットワークとに分類し、前記無線端末はホームネットワークのドメインIDをあらかじめ記憶し、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ品質が最も優れる無線基地局を選択し、

【0015】無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在せず、かつホームネットワークと異なるドメインIDを持つ無線基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ品質の最も優れる無線基地局を選択することを特徴とする。

【0016】従来技術とは、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ品質が最も優れる無線基地局を選択し、

【0017】無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ基地局が存在せず、かつホームネットワークと異なるドメインIDを持つ無線基地局が存在する場合は、ホー

ムネットワークと異なるドメインIDを持ちかつ品質の最も優れる無線基地局を選択する点が異なる。

【0018】本発明は、所要品質を満たすホームネットワーク基地局が存在しないとき、所要品質を満たすリモートネットワーク基地局を選択することが可能であり、無線端末がリモートネットワークに移動した場合も、パケット転送プロトコルにより通信を継続可能な効果を得られる。

【0019】また、無線端末がホームネットワーク基地局とリモートネットワーク基地局のエリアのオーバーラップした位置に移動したとき、ホームネットワーク基地局を優先して選択することが可能であり、リモートネットワークとホームネットワーク間のパケット転送プロトコルのオーバーヘッドによる通信効率の低下を防止する効果を得られる。

【0020】請求項2に記載の発明は、ドメインIDにより識別される複数のサブネットワーク間を接続して1つのネットワークを構成し、前記サブネットワークは複数の無線基地局を持ち、前記無線基地局は自己の接続する前記サブネットワークのドメインIDと各無線基地局を識別する基地局IDと、該無線基地局を介して前記ネットワークと通信を行う無線端末を認証する機能を持ち、前記無線端末は通信を行う際に、無線通信の所要品質を満たす位置にある複数の前記無線基地局の中から1つを選択する無線基地局選択方法において、

【0021】サブネットワークを、移動する前記無線端末が最も頻繁に接続するホームネットワークと、前記無線端末が移動先で接続するリモートネットワークとに分類し、前記無線端末はホームネットワークのドメインIDをあらかじめ記憶し、また認証拒否された無線基地局のドメインIDを認証拒否ドメインリストに記憶する機能を持ち、

【0022】無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ無線基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ品質が最も優れる無線基地局を選択して接続し、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ基地局が存在せず、かつホームネットワークと異なるドメインIDを持ちかつ接続拒否ドメインリストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ち、かつ接続拒否ドメインリストに未登録で、かつ品質が最も優れる無線基地局に認証を要求し、

【0023】認証の結果接続を拒否された場合は、該無線基地局のドメインIDを接続拒否ドメインリストに追加した後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと異なるドメインIDを持ち、かつ接続拒否ドメインリストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメ

インIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返し、認証の結果接続を許可された場合は該無線基地局を選択して接続することを特徴とする。

【0024】従来技術とは、前記無線端末は認証拒否された基地局のドメインIDを認証拒否ドメインリストに記憶する機能を持ち、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ品質が最も優れる無線

基地局を選択して接続し、
【0025】無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持つ基地局が存在せず、かつホームネットワークと異なるドメインIDを持ちかつ接続拒否ドメインリストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ち、かつ接続拒否ドメインリストに未登録でかつ品質が最も優れる無線基地局に認証を要求し、

【0026】認証の結果接続を拒否された場合は、該無線基地局のドメインIDを接続拒否ドメインリストに追加した後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと異なるドメインIDを持ち、かつ接続拒否ドメインリストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ち、かつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返し、認証の結果、接続を許可された場合は、該無線基地局を選択して接続する構成を有する点において異なる。

【0027】本発明は、請求項1に記載の発明の効果に加えリモートネットワーク側で移動してきた無線端末の認証が可能であり、不特定の無線端末がネットワークにアクセスするのを防止する効果が得られる。また、無線端末は、認証拒否された基地局のドメインIDを記憶して、基地局選択から除外することが可能であり、基地局の再選択時に認証拒否された基地局、及び同じリモートネットワークに接続する他の基地局を再び選択して認証要求、認証拒否を繰り返すことを防止し、基地局選択時間を短縮する効果が得られる。

【0028】請求項3に記載の発明は、ドメインIDにより識別される複数のサブネットワーク間を接続して1つのネットワークを構成し、前記サブネットワークは、複数の無線基地局を持ち、前記無線基地局は自己の所属する前記サブネットワークのドメインIDと各無線基地局を識別する基地局IDと、該無線基地局を介して前記ネットワークと通信を行う無線端末を認証する機能を持ち、

【0029】無線端末は通信を行う際に、無線通信の所要品質を満たす位置にある複数の無線基地局の中から1

つを選択する無線基地局選択方法において、サブネットワークを、移動する前記無線端末が最も頻繁に接続するホームネットワークと、前記無線端末が移動先で接続するリモートネットワークとに分類し、前記無線端末はホームネットワークのドメインIDをあらかじめ記憶し、また認証拒否された基地局IDを認証拒否基地局リストに記憶する機能を持ち、

【0030】無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求し、

【0031】認証の結果接続を拒否された場合は、該無線基地局の基地局IDを接続拒否基地局リストに追加した後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返

し、
【0032】無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在せず、かつホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録でかつ品質が最も優れる無線基地局を選択して認証を要求し、

【0033】認証の結果接続を拒否された場合は該無線基地局の基地局IDを接続拒否基地局リストに追加した後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと異なるドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返し、認証の結果、接続を許可された場合は該無線基地局を選択することを特徴とする。

【0034】従来技術とは、前記無線端末は認証拒否された基地局IDを認証拒否基地局リストに記憶する機能を持ち、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求し、

【0035】認証の結果接続を拒否された場合は該無線基地局の基地局IDを接続拒否基地局リストに追加した

10

20

30

40

50

後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと同じドメインIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返す、

【0036】無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと同じドメインIDを持ちかつ接続拒否基地局リストに未登録な基地局が存在せず、かつホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録でかつ品質が最も優れる無線基地局に認証を要求し、

【0037】認証の結果接続を拒否された場合は、該無線基地局の基地局IDを接続拒否基地局リストに追加した後、再び、無線通信の所要品質を満たす複数の無線基地局の中にホームネットワークと異なるドメインIDを持ち、かつ接続拒否基地局リストに未登録な基地局が存在する場合は、ホームネットワークと異なるドメインIDを持ちかつ接続拒否基地局リストに未登録で、かつ品質が最も優れる無線基地局に認証を要求する動作を繰り返す、認証の結果接続を許可された場合は該無線基地局を選択する構成を有する点において異なる。

【0038】本発明は、請求項1に記載の発明の効果に加え、リモートネットワーク側で移動してきた無線端末の認証が可能であり、不特定の無線端末がネットワークにアクセスするのを防止する効果が得られる。また、基地局毎に無線LAN端末の認証許可または拒否を設定可能であり、リモートネットワーク側で移動してきた無線端末を収容する基地局を限定可能な効果が得られる。

【0039】また、無線端末は認証拒否された基地局IDを記憶して、基地局選択から除外することが可能であり、基地局の再選択時に認証拒否された基地局を再び選択して認証要求、認証拒否を繰り返すことを防止し、基地局選択時間を短縮する効果が得られる。

【0040】請求項4に記載の発明は、請求項1から請求項3に記載の発明の持つ特徴に加えて、無線LAN端末にスイッチを設け、無線LAN端末は電源投入時または無線通信の品質劣化を検出したときまたは前記スイッチをユーザがONしたときまたは周期的に無線基地局の選択動作を起動することを特徴とする。

【0041】本発明は、請求項1から請求項3に記載の発明が有する効果に加え、無線端末が電源投入したとき自動的に基地局を選択することが可能であり、ユーザが電源投入の度にスイッチにより基地局選択方法を起動する手間を防止する効果が得られる。

【0042】また、品質劣化時に自動的に基地局を選択することが可能であり、端末移動時に、より品質のよい

基地局に接続を切り替え、品質劣化による通信効率の低下を防止する効果が得られる。

【0043】また、無線端末が一旦リモートネットワーク基地局を選択して通信開始後、ホームネットワークに移動したにもかかわらず、無線通信の品質が所要品質以上で基地局選択方法が自動的に起動しないとき、ユーザがスイッチにより起動することが可能であり、リモートネットワークとホームネットワーク間のパケット転送プロトコルのオーバーヘッドによる通信効率の低下を防止する効果が得られる。

【0044】請求項5に記載の発明は、請求項1～請求項4に記載の発明の持つ特徴に加えて、無線通信の品質として、無線基地局からの受信電解強度を用いることを特徴とする。本発明は、請求項1～4に記載の発明が有する効果に加え、無線基地局からの受信電解強度が閾値以下のとき自動的に基地局選択方法を起動して受信電解強度の大きい基地局にハンドオフ可能であり、無線通信の品質劣化による通信効率の低下を防止する効果が得られる。

【0045】請求項6に記載の発明は、請求項1～請求項4に記載の発明の持つ特徴に加えて、無線通信の品質として、無線基地局からの受信信号の誤り率を用いることを特徴とする。本発明は、請求項1または2または3または4に記載の発明が有する効果に加え、無線基地局からの受信信号の誤り率が閾値を越えたとき自動的に基地局選択方法を起動して誤り率の低い基地局にハンドオフ可能であり、無線通信の品質劣化による通信効率の低下を防止する効果が得られる。

【0046】請求項7に記載の発明は、請求項1～請求項4に記載の発明の持つ特徴に加えて、無線通信の品質として、無線基地局のトラヒック負荷を用いることを特徴とする。本発明は、請求項1～請求項4に記載の発明が有する効果に加え、無線基地局のトラヒック負荷が閾値を越えたとき自動的に基地局選択方法を起動してトラヒック負荷の小さい基地局へハンドオフ可能であり、トラヒック増加による回線の容量不足に起因する通信効率の低下を防止する効果が得られる。

【0047】

【発明の実施の形態】以下、本発明の各実施形態について、図面を参照して説明する。まず、各実施形態におけるネットワーク構成を図1に示す。同図において、数字符号1～3は無線基地局、4は無線LAN端末、5はルータ、6、～6、は無線ゾーン、7はホームネットワーク、8はリモートネットワークを表している。無線ゾーンは単独または、複数でサブネットワークを形成する。

【0048】同図に示すように、複数のサブネットワークをルータ5を介して接続してネットワークを構成する。サブネットワークは複数の無線基地局を持ち、前記無線基地局は自己の所属するサブネットワークを表すドメインIDと基地局IDを持つ。

10

20

30

40

50

【0049】サブネットワークは、移動する無線LAN端末4が通常接続するホームネットワークと、移動先で接続するリモートネットワークに分類され、ホームネットワークに属する無線基地局をホーム基地局、リモートネットワークに属する基地局をリモート基地局と呼ぶ。図では、数字符号以外にも、ホーム基地局をH、リモート基地局をR、無線LAN端末をSとして表している。

【0050】以下に、本発明の第1の実施の形態として、請求項1に記載の基地局選択方法を適用した場合の例について説明する。基地局は、周期的に自局の基地局*10

基地局リスト

品質順位	基地局ID	ドメインID
1	#3	#b
2	#2	#a
3	#1	#a

【0053】ここでは、品質の良い順にリスト先頭からリストアップされているものとする。基地局リスト内にホーム基地局が存在する場合（S2-2のY）は、品質最良のホーム基地局を選択し（S2-3）、ホーム基地局が存在しない場合（S2-2のN）は、リモート基地局の中から品質最良のリモート基地局を選択する（S2-4、S2-5）。所要品質を満たす基地局が存在しない場合（S2-4のN）は、サービスエリア圏外と判断する（S2-6）。

【0054】図3として、無線LAN端末4が、同図（a）に示すように、ホーム基地局とリモート基地局のサービスエリアがオーバーラップした位置にある場合の、基地局リストの例を（b）に示す。品質最良の基地局はリモート基地局であるが、所要品質を満たすホーム基地局が存在するため、無線LAN端末はホーム基地局#2を選択して接続する。同図における数字符号は、図1の場合と同様であるが、この図では、IDを#を付した数字あるいは英字で示している。これは以降説明する他の図についても同様である。

【0055】図4として、無線LAN端末4が、同図（a）に示すように、リモート基地局のサービスエリア※

認証拒否ドメインリスト

認証拒否ドメインID
#b
#c
#d

書き込み順

【0059】なお、例えば、認証拒否ドメインリストの最大記憶数は、ある位置で互いの無線エリアがオーバ

*IDと、ドメインIDを、報知信号により送信する。

【0051】図2に、無線LAN端末の基地局選択動作手順の流れ図として示す。図中の（S-1）～（S-6）の表示はステップを表すものであり、以下の説明中の表示と対応する。無線LAN端末は、一定期間周辺基地局の報知信号を受信して、所要品質を満たす基地局のリスト（基地局リスト）を作成する（S-1）。表1に基地局リストの例を示す。

【0052】

【表1】

※で、かつホーム基地局のサービスエリア圏外の位置にある場合の、基地局リストの例を（b）に示す。所要品質を満たすホーム基地局が存在しないため、無線LAN端末はリモート基地局#3を選択して接続する。

【0056】本発明の第2の実施形態として、請求項2に記載の基地局選択方法を適用した場合の例について説明する。基地局は、周期的に自局の基地局IDと、ドメインIDを、報知信号により送信する。また、基地局は、無線LAN端末を認証する機能を持ち、あらかじめ登録されていない無線LAN端末に対しては認証を拒否し、通信を許可しない。

【0057】図5に無線LAN端末の基地局選択動作手順を示す。無線LAN端末4は一定期間周辺基地局の報知信号を受信して、所要品質を満たす基地局のリスト（基地局リスト）を作成する（S5-1）。基地局リストは表1に等しい。また、認証を拒否した基地局のドメインIDを認証拒否ドメインリストに記憶する。表2に認証拒否ドメインリストの例を示す。

【0058】

【表2】

ップするドメインの最大数、あるいはそれより十分大きくとることもできる。仮に記憶するドメインIDの数

が、認証拒否ドメインリストの最大数を越える場合は、最も古いドメインIDを削除してから、記憶するものとする。

【0060】基地局リスト内にホーム基地局が存在する場合（S5-2のY）は、品質最良のホーム基地局を選択（S5-3）し、ホーム基地局が存在しない場合（S5-2のN）は、リモート基地局の中から、認証拒否ドメインリストに記憶されているドメイン以外の基地局で、かつ品質最良のリモート基地局に認証を要求する（S5-4～S5-7）。

【0061】認証OKの場合（S5-8のY）は、基地局選択処理を終了する。認証拒否の場合（S5-8のN）は、該リモート基地局のドメインIDを認証拒否ドメインリストに記憶（S5-9）した後、次の品質のリモート基地局に認証を要求（S5-10）する。認証拒否ドメインリストに記憶されているドメイン以外でかつ所要品質を満たす基地局が存在しない場合（S5-11）は、サービスエリア圏外と判断する。

【0062】図6として、無線LAN端末4が同図

認証拒否基地局リスト

認証拒否基地局ID
#1
#2
#3

書き込み順

【0066】なお、認証拒否基地局リストの最大記憶数は、ある位置で互いの無線エリアがオーバーラップする基地局の最大数より十分大きいものとする。記憶する基地局IDの数が認証拒否基地局リストの最大数を越える場合は、最も古い基地局IDを削除してから、記憶するものとする（S7-1）。

【0067】基地局リスト内にホーム基地局が存在する場合（S7-2のY）は、認証拒否基地局リストに記憶されていない基地局で、かつ品質最良のホーム基地局に認証を要求する（S7-3～S7-5）。認証OKの場合（S7-6のY）は、基地局選択処理を終了する。認証拒否の場合（S7-6のN）は、該ホーム基地局の基地局IDを認証拒否基地局リストに記憶（S7-7）した後、次の品質のホーム基地局に認証を要求する（S7-8）。

【0068】所要品質を満たしかつ認証拒否基地局リストに記憶されていないホーム基地局が存在しない（S7-9のY）場合は、リモート基地局の中から、認証拒否基地局リストに記憶されていない基地局でかつ品質最良のリモート基地局に認証を要求する（S7-10～S7-13）。認証OKの場合（S-14のY）は基地局選択処理を終了する。

【0069】認証拒否の場合（S7-14のN）は該リモート基地局の基地局IDを認証拒否基地局リストに記憶（S7-15）した後、次の品質のリモート基地局に

*（a）に示すように、リモート基地局のサービスエリアがオーバーラップした位置にある場合の基地局リストと認証拒否ドメインリストの例を（b）に示す。無線LAN端末4は、図5の手順により、リモート基地局#3に認証を要求する。認証OKの場合はリモート基地局#3に接続する。

【0063】本発明の第3の実施の形態として、請求項3記載の基地局選択方法を適用した場合の例について説明する。基地局は、周期的に自局の基地局IDとドメインIDを報知信号により送信する。

【0064】図7に無線LAN端末の基地局選択動作手順の流れ図として示す。無線LAN端末4は、一定期間周辺基地局の報知信号を受信して、所要品質を満たす基地局のリスト（基地局リスト）を作成する。基地局リストは表1に等しい。また、認証を拒否した基地局のドメインIDを認証拒否基地局リストに記憶する。表3に認証拒否基地局リストを示す。

【0065】

【表3】

認証を要求する（S7-16）。認証拒否基地局リストに記憶されていない基地局でかつ、所要品質を満たす基地局が存在しない場合（S7-17のY）は、サービスエリア圏外と判断する。

【0070】図8として無線LAN端末4が同図（a）に示すように、リモート基地局のサービスエリアがオーバーラップした位置にある場合の基地局リストと認証拒否基地局リストの例を（b）に示す。無線LAN端末4は図7の手順により、リモート基地局#5に認証を要求する。認証OKの場合は、リモート基地局#5に接続する。

【0071】本発明の第4の実施形態として、請求項4記載の基地局選択方法を適用した場合の例について説明する。基地局は、周期的に自局の基地局IDとドメインIDを報知信号により送信する。

【0072】図9に無線LAN端末4の基地局選択動作手順の流れ図として示す。図中の基地局選択部S9-5には図2または図5または図7に示した手順が適用される。無線LAN端末4は、通信品質を監視する機能と、ユーザが基地局選択方法を起動するための起動スイッチと、周期的に基地局選択方法を起動するための検索タイマを持つ。

【0073】無線LAN端末4は、端末電源投入時（S9-1）、または通信品質が所要品質以下に劣化したとき（S9-2）、またはユーザが起動スイッチにより基

10

30

40

50

地局選択方法を起動したとき(S9-3)、または検索タイムがタイムオーバーしたとき(S9-4)、基地局選択手順を起動する(S9-5)。基地局選択終了時は検索タイムをリスタートする(S9-7)。

【0074】図10に無線LAN端末がリモート基地局にB地点で接続した後にA地点まで移動した場合を示す。ここでは、基地局選択手順として図2に示す手順を適用しているものとする。A地点ではリモート基地局との通信品質が所要品質を満たしているため、品質劣化により基地局選択手順は起動されない。ユーザが起動スイッチをONするか、または検索タイムのタイムオーバーにより図2に示す基地局選択手順が起動され、ホーム基地局に接続を切り替える。

【0075】本発明の第5の実施形態として、請求項5記載の基地局選択方法を適用した場合の例について説明する。この例の場合は、図2、または図5、または図7に示す基地局動作手順内の基地局リスト作成時に、基地局からの受信信号の受信電解強度を測定して受信電解強度の大きい基地局を上位に、受信電解強度の小さい基地局を下位とする。

【0076】本発明の第6の実施形態として、請求項6記載の基地局選択方法を適用した場合の例について説明する。この例の場合は、図2、または図5、または図7に示す基地局動作手順内の基地局リスト作成時に、基地局からの受信信号の誤り率を測定して誤り率の小さい基地局を上位に、誤り率の大きい基地局を下位とする。

【0077】本発明の第7の実施形態として、請求項7記載の基地局選択方法を適用した場合の例について説明する。基地局は、自局のトラヒック負荷を測定し、周期的に、報知信号により送信する。この例の場合は、図2、または図5、または図7に示す基地局動作手順内の基地局リスト作成時に、基地局からの報知信号を受信して、トラヒック負荷の小さい基地局を上位に、トラヒック負荷の大きい基地局を下位とする。

【0078】

【発明の効果】以上、詳細に説明したように、本発明によれば、無線端末が、リモートネットワークに移動したとき、リモートネットワーク基地局に接続できないという従来の課題を解決し、ホームネットワークとリモート

ネットワーク間のバケット転送プロトコルを利用して通信の継続が可能な無線基地局選択方法を提供することができる利点がある。

【0079】また、ホームネットワークの基地局と、リモートネットワークの基地局エリアが、オーバーラップしている位置に無線端末が移動したとき、ホームネットワークの基地局からの受信電解強度が所要品質を満たしている場合でも、リモートネットワークの基地局を選択して接続するという従来技術の課題を解決し、バケット転送プロトコルのオーバーヘッドによる通信効率の低下を抑制することが可能な無線基地局選択方法を提供することができる利点がある。

【図面の簡単な説明】

【図1】本発明を適用するネットワーク構成を示す図である。

【図2】第1の実施の形態における無線LAN端末の基地局選択手順を示す流れ図である。

【図3】第1の実施の形態について説明する図(その1)である。

20 【図4】第1の実施の形態について説明する図(その2)である。

【図5】第2の実施の形態における無線LAN端末の基地局選択手順を示す流れ図である。

【図6】第2の実施の形態について説明する図である。

【図7】第3の実施の形態における無線LAN端末の基地局選択手順を示す流れ図である。

【図8】第3の実施の形態について説明する図である。

【図9】第4の実施の形態における無線LAN端末の基地局選択手順を示す流れ図である。

30 【図10】第4の実施の形態について説明する図である。

【符号の説明】

1～3 無線基地局

4 無線LAN端末

5 ルータ

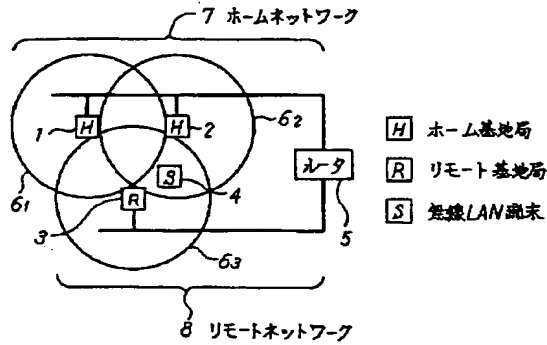
6、～6、 無線ゾーン

7 ホームネットワーク

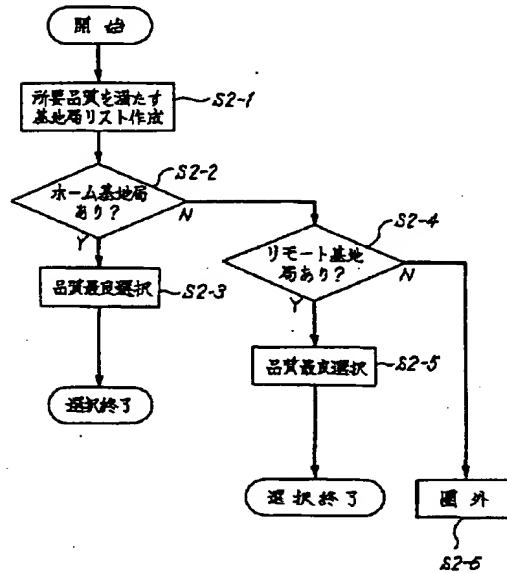
8、8、8、 リモートネットワーク

【図1】

本発明を適用するネットワーク構成を示す図

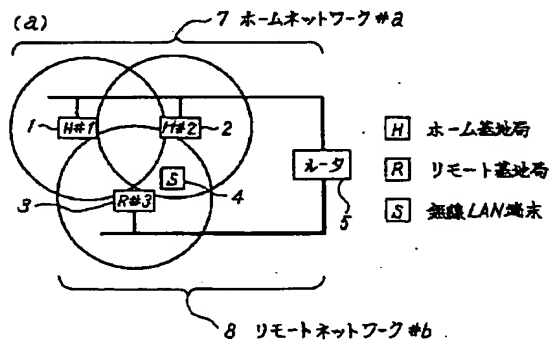


【図2】

第1の実施の形態における無線LAN端末の
基地局選択手順を示す流れ図

【図3】

第1の実施の形態について説明する図(その1)



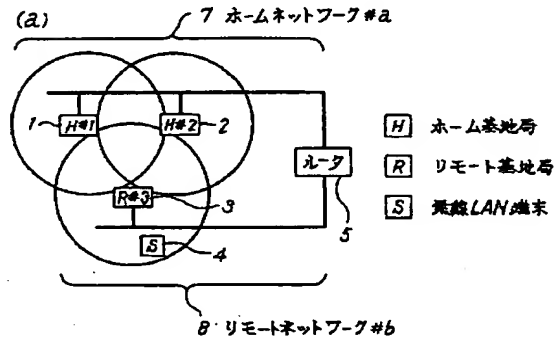
(b)

品質順位	基地局ID	ドメインID
1	#3	#b
2	#2	#a
3	#1	#a

← 選択

【図4】

第1の実施の形態について説明する図(その2)



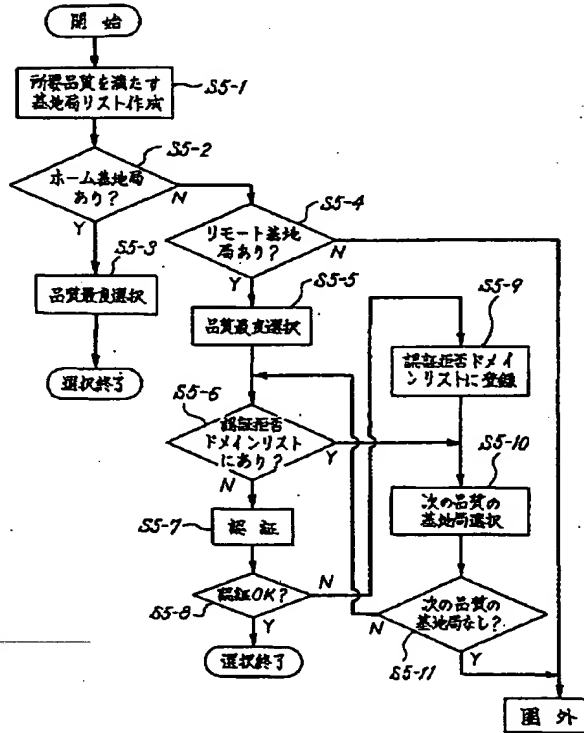
(b)

品質順位	基地局ID	ドメインID
1	#3	#b
2		
3		

← 選択

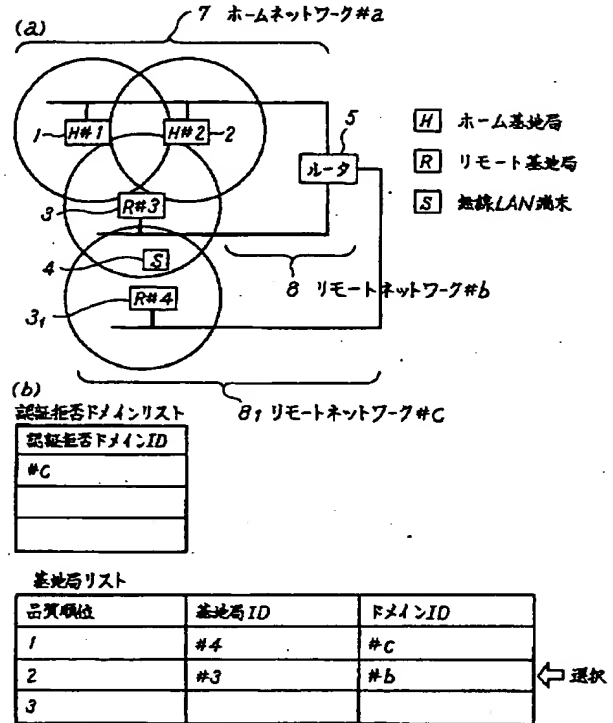
【図5】

第2の実施の形態における無線LAN端末の
基地局選択手順を示す流れ図



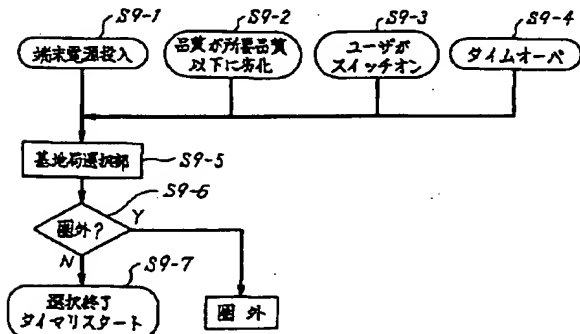
【図6】

第2の実施の形態について説明する図



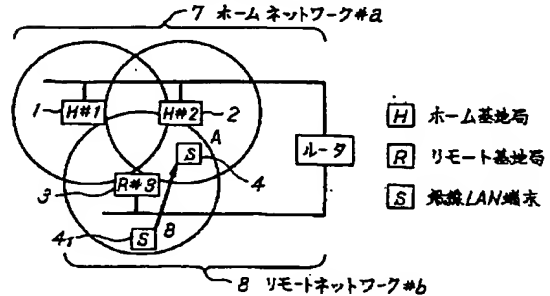
【図9】

第4の実施の形態における無線LAN端末の
基地局選択手順を示す流れ図



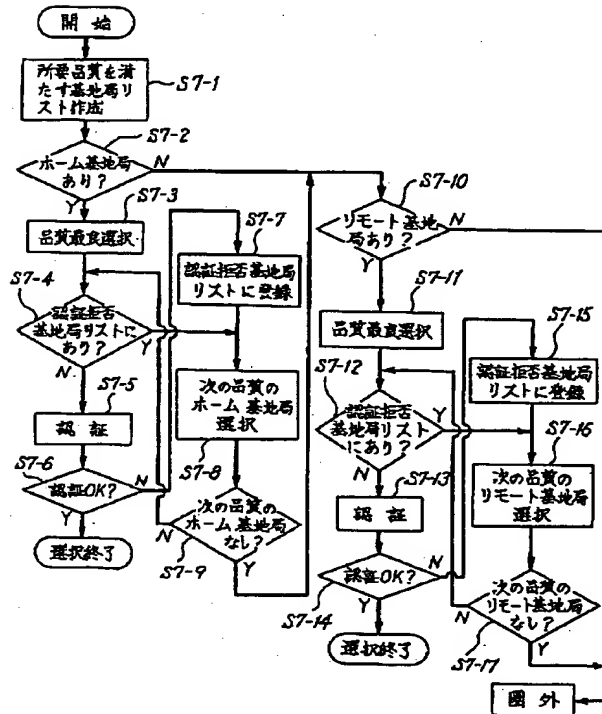
【図10】

第4の実施の形態について説明する図



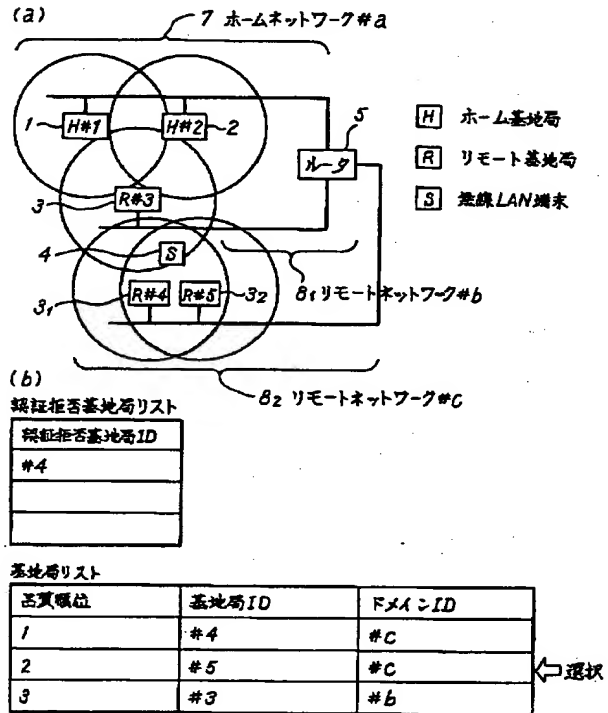
【図7】

第3の実施の形態における無線LAN端末の
基地局選択手順を示す流れ図



【図8】

第3の実施の形態について説明する図



フロントページの続き

(72)発明者 守倉 正博

東京都新宿区西新宿三丁目19番2号 日本
電信電話株式会社内